

T09D04 – (19.2) HL Electrolysis

Name.....

1. 19.2.1 Predict and explain the products of electrolysis of aqueous solutions. (3)
- a. How does the electrolysis of an aqueous solution differ from a molten solution?

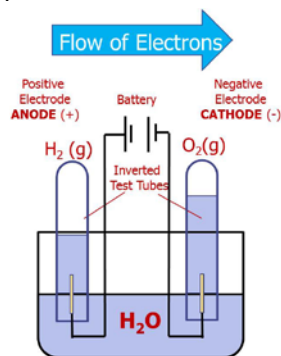
- b. Depending on the concentration of salt, complete the following table:

Condition	Anode (+)	Cathode (-)
NaCl is Molten		
NaCl(aq) is concentrated		
NaCl(aq) is dilute		

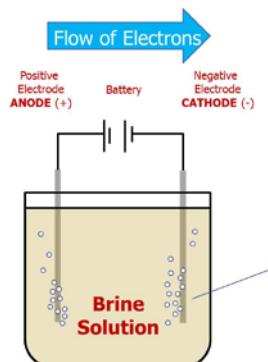
- c. Using the following table, explain the occurrence at each electrode given certain conditions (general rules):

Electrolyte	Electrodes	(-) Cathode $\frac{1}{2}$	(+) Anode $\frac{1}{2}$
KBr (aq)	Graphite	$2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$	$2\text{Br}^- \rightarrow \text{Br}_2 + 2\text{e}^-$
$\text{MgSO}_4(\text{aq})$	Graphite	$4\text{H}^+(\text{aq}) + 4\text{e}^- \rightarrow 2\text{H}_2(\text{g})$	$4\text{OH}^- \rightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4\text{e}^-$
Conc HCl(aq)	Graphite	$2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$	$2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}^-$
Dilute $\text{H}_2\text{SO}_4(\text{aq})$	Graphite	$2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$	$4\text{OH}^- \rightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4\text{e}^-$
Dilute NaOH(aq)	Graphite	$2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$	$4\text{OH}^- \rightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4\text{e}^-$
$\text{CuSO}_4(\text{aq})$	Graphite	$\text{Cu}^{2+} + 2\text{e}^- \rightarrow \text{Cu}$	$4\text{OH}^- \rightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4\text{e}^-$
$\text{CuSO}_4(\text{aq})$	Copper	$\text{Cu}^{2+} + 2\text{e}^- \rightarrow \text{Cu}$	$\text{Cu} \rightarrow \text{Cu}^{2+} + 2\text{e}^-$
$\text{CuCl}_2(\text{aq})$	Carbon	$\text{Cu}^{2+} + 2\text{e}^- \rightarrow \text{Cu}$	$2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}^-$
KI(aq)	Carbon	$2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$	$2\text{I}^- \rightarrow \text{I}_2 + 2\text{e}^-$

- d. Diagram the electrolysis of Water:



- e. Diagram the electrolysis of Brine:



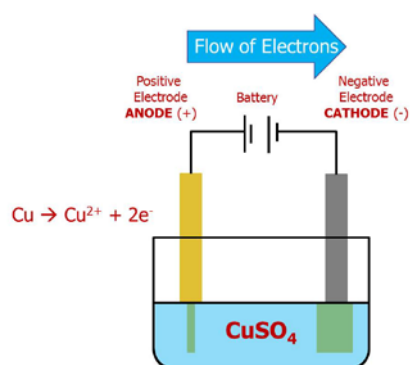
2. 19.2.2 Determine the relative amounts of the products formed during electrolysis. (3)
- a. Electrolysis can be used to:

b. Discuss Faraday's Constant:

c. Discuss Faraday's 1st Law:

d. Discuss Faraday's 2nd Law:

3. 19.2.3 Describe the use of electrolysis in electroplating.



a. Discuss electroplating:

b. In order to obtain a good coating of a metal during electroplating: